Journal of Fermentation and Bioengineering

VOLUME 80 · 1995

THE SOCIETY FOR FERMENTATION AND BIOENGINEERING, JAPAN

JOURNAL OF FERMENTATION AND BIOENGINEERING

Chairman: Tohru KODAMA

International Editors: Itaru URABE (Editor in Chief, Japan), Bo MATTIASSON (Sweden, Europe), Peter L. ROGERS (Australia, Oceania), Henry Y. WANG (USA, America)

Editorial Board:

John P. BARFORD (Australia)
Amaret BHUMIRATANA (Thailand)
Ho Nam CHANG (South Korea)
Howard CHASE (UK)
Cha Yong CHOI (South Korea)
Charles L. COONEY (USA)
Kenji FURUKAWA (Japan)
Katsuya GOMI (Japan)
Olle HOLST (Sweden)
Hiroyuki HONDA (Japan)
Wei-Shou HU (USA)
Shih-Yow HUANG (R. O. China)
Shinji IIJIMA (Japan)
Mahendra K. JAIN (USA)
Michimasa KISHIMOTO (Japan)
Yourong LI (P. R. China)
Ian S. MADDOX (New Zealand)
Tohru NAGASAWA (Japan)
Tadaatsu NAKAHARA (Japan)
Takuya NIHIRA (Japan)
Hisao OHTAKE (Japan)
Tetsuo OKA (Japan)
POH Chit Laa (Singapore)
Dewey RYU (USA)
Rolf D. SCHMID (Germany)
Kazuyuki SHIMIZU (Japan)
Sakayu SHIMIZU (Japan)
Atsuhiko SHINMYO (Japan)
Kenji SONOMOTO (Japan)
Masahiro TAKAGI (Japan)
Johannes TRAMPER (Netherlands)
Mitsuyoshi UEDA (Japan)
Erick VANDAMME (Belgium)
Kenji YAMAMOTO (Japan)
Koji YODA (Japan)

THE SOCIETY FOR FERMENTATION AND BIOENGINEERING, JAPAN

% Faculty of Engineering, Osaka University,
2–1 Yamadaoka, Suita,
Osaka 565, Japan

Journal of Fermentation and Bioengineering

CONTENTS
VOLUME 80 • 1995

ORIGINALS

High Level Expression of Protein L, an Immunoglobulin-Binding Protein, in *Escherichia coli.* Anita Tocaj, Ulf Sjöbring, Lars Björck, and Olle Holst 1- 5

Adsorption of Protein onto Stainless-Steel Surfaces. Satoshi Fukuzaki, Hiromi Urano, and Kazuya Nagata 6-11

Characterization of Endo-Type 6-Aminohexanoate-Oligomer Hydrolase from *Flavobacterium* sp. Shinji Kakudo, Seiji Negoro, Itaru Urabe, and Hirosuke Okada 12-17

Glucosylation of Caffeic Acid with *Bacillus subtilis* X-23 α-Amylase and a Description of the Glucosides. Takahisa Nishimura, Takashi Kometani, Hiroshi Takii, Yoshinobu Terada, and Shigetaka Okada 18-23

Esterification of Glycosides by a Mono- and Diacylglycerol Lipase from *Penicillium camembertii* and Comparison of the Products with *Candida cylindracea* Lipase. Hirofumi Nakano, Sumio Kitahata, Yuji Shimada, Masaki Nakamura, and Yoshio Tominaga 24-29

Immobilization of HLADH on Polymer Materials for Reduction of Cyclohexanone with NADH Regeneration under Two-Phase Conditions. Toshiaki Itozawa and Hideo Kise 30-34

Production of Neutral Protease by Membrane-Surface Liquid Culture of *Aspergillus oryzae* IAM2704. Akinori Ogawa, Akinori Yasuhara, Takaaki Tanaka, Takaharu Sakiyama, and Kazuhiro Nakanishi 35-40

Production of Kojic Acid by Membrane-Surface Liquid Culture of *Aspergillus oryzae* NRRL484. Akinori Ogawa, Yasushi Wakisaka, Takaaki Tanaka, Takaharu Sakiyama, and Kazuhiro Nakanishi 41-45

Refinement of Low-Grade Clay by Microbial Removal of Sulfur and Iron Compounds Using *Thiobacillus ferrooxidans.* Hee Wook Ryu, Kyeoung Suk Cho, Yong Keun Chang, Sang Done Kim, and Tadahiro Mori 46-52

Light Penetration into Cell Suspensions of Photosynthetic Bacteria and Relation to Hydrogen Production. Eiju Nakada, Yasuo Asada, Takaaki Arai, and Jun Miyake 53-57

Application of an Expert System to High Cell Density Cultivation of *Escherichia coli.* Michimasa Kishimoto and Hideyuki Suzuki 58-62

Acquisition of Data from On-Line Laser Turbidimeter and Calculation of Some Kinetic Variables in Computer-Coupled Automated Fed-Batch Culture. Yasuyuki Kadotani, Kohji Miyamoto, Naoto Mishima, Minoru Kominami, and Tsuneo Yamane 63-70

Characterization and Modeling of Oxygen Transfer in a 20-*l* Modified Cell-Lift Bioreactor with a Double-Screen Cage. Si-Jing Wang, Jian-Jiang Zhong, Yin-Liang Chen, and Jun-Tang Yu 71- 77

Affinity Partitioning of Protein A Using a Magnetic Aqueous Two-Phase System. Motoshi Suzuki, Masamichi Kamihira, Tomoki Shiraishi, Hiroshi Takeuchi, and Takeshi Kobayashi 78- 84

Expression Pattern of Bacterial Polycistronic Genes in Tobacco Cells. Hyeon-Je Cho, Hiromichi Morikawa, and Yoshikatsu Murooka 111–117

Cloning and Expression of the Isopenicillin N Synthase Gene from *Lysobacter lactamgenus* YK90. Hiroyuki Kimura, Masaru Suzuki, and Yasuhiro Sumino 118–123

Characterization of Starch-Hydrolyzing Lactic Acid Bacteria Isolated from a Fermented Fish and Rice Food, "Burong Isda", and Its Amylolytic Enzyme. Minerva Olympia, Hajime Fukuda, Hisayo Ono, Yoshinobu Kaneko, and Mitsuo Takano 124–130

Effect of Salt Stress on Plasma Membrane Permeability and Lipid Saturation in the Salt-Tolerant Yeast *Zygosaccharomyces rouxii*. Shigetoshi Yoshikawa, Nobuo Mitsui, Ken-ichi Chikara, Hajime Hashimoto, Makoto Shimosaka, and Mitsuo Okazaki 131–135

Calculation of Relative Binding of Free Energy of Vancomycin with Diacetyl-L-Lysyl-D-Alanyl-D-Alanine and Diacetyl-L-Lysyl-L-Alanyl-L-Alanine. Wen-Yih Chen, Lee-Kang Wang, Ching-Fa Wu, and Chih-Yao Tseng 136–140

Linear Free Energy Relationship of Nonaqueous Biocatalysis: Analysis of Solvent Effects on Enzyme Enantioselectivity. Sun Bok Lee 141–147

Purification and Characteristics of Chitinase Secreted by Cultured *Wasabia japonica* Cells. Yoshinari Yamamoto, Yukio Fukunaga, Hideki Aoyagi, and Hideo Tanaka 148–152

Purification and Characterization of Novel Chitinases from *Streptomyces griseus* HUT 6037. Masaru Mitsutomi, Toshinao Hata, and Tetsuji Kuwahara ... 153–158

***Kluyveromyces marxianus* CDBB-L-278: A Wild Inulinase Hyperproducing Strain.** Alma Cruz-Guerrero, Ines Garcia-Peña, Eduardo Barzana, Mariano Garcia-Garibay, and Lorena Gomez-Ruiz 159–163

Continuous Production of Fructose Syrups from Inulin by Immobilized Inulinase from *Aspergillus niger* Mutant 817. Toyohiko Nakamura, Yasuko Ogata, Akichika Shitara, Akihiro Nakamura, and Kazuyoshi Ohta 164–169

Lipase-Surfactant Complex as Catalyst of Interesterification and Esterification in Organic Media. Yasuyuki Isono, Hiroshi Nabetani, and Mitsutoshi Nakajima 170–175

Asymmetric Bioreduction of a β-Ketoester to (*R*)-β-Hydroxyester by the Fungus *Mortierella alpina* MF 5534. Michel Chartrain, Joseph Armstrong, Lorraine Katz, Jennifer Keller, David Mathre, and Randolph Greasham ... 176–179

Oxidative Resolution with Bakers' Yeast for Large-Scale Production of Chiral 1,2-Alkanediols. Tadashi Kometani, Yasufumi Morita, Hidefumi Yoshii, Yoshiharu Kiyama, and Ryuichi Matsuno 180–184

Continuous Production of Acetone-Butanol-Ethanol Using Immobilized Cells of *Clostridium acetobutylicum* and Integration with Product Removal by Liquid-Liquid Extraction. Nasibuddin Qureshi and Ian S. Maddox 185–189

Utilization of Citrus By-Products and Wastes as Beverage Clouding Agents. Hassan K. Sreenath, Philip G. Crandall, and Robert A. Baker 190–194

Growth of and Production of γ-Decalactone by *Sporobolomyces odorus* in Jar Fermentors as Affected by pH, Aeration and Fed-Batch Technique. Shiow-Ling Lee, Shen-Juh Lin, and Cheng-Chun Chou 195–199

Immunoassay Using HPLAC and Fluorescence-Labeled Antibodies. Tomohiro Yoshikawa, Masaaki Terashima, and Shigeo Katoh 200–203

Initiation Methionine of Recombinant Interleukin-2 is Completely Processed *In Vivo* by Replacement of the Second Proline Residue. Takuya Watanabe, Masato Kuriyama, Susumu Honda, Hidekazu Sawada, and Kazuaki

Kitano 213-217

High Glycerol Producing Amino Acid Analogue-Resistant *Saccharomyces cerevisiae* Mutant. Toshiro Omori, Hideharu Takashita, Nanako Omori, and Masahiko Shimoda 218-222

Microbial Production of Hydroxy-C_{19}-Steroids as Estrogen Synthetase (P-450 · Aromatase) Inhibitors. Shigeru Mineki, Mitsugi Iida, Katsuya Kato, Fuyuki Fukaya, Kazuhiro Kita, Junji Nakamura, and Makoto Yoshihama... 223-228

Structure of the Gene Encoding β-1,3-Glucanase B of *Bacillus circulans* WL-12. Takeshi Okada, Makoto Aisaka, Kazuhiko Aida, Naoki Nikaidou, Hirosato Tanaka, and Takeshi Watanabe 229-236

Isolation and Characterization of Urea-Resistant *Staphylococcus aureus* V8 Protease Derivatives. Masayuki Yabuta, Seiko Onai-Miura, and Kazuhiro Ohsuye 237-243

Chiral Bio-Resolution of Racemic Indene Oxide by Fungal Epoxide Hydrolases. Jinyou Zhang, Jay Reddy, Christopher Roberge, Chris Senanayake, Randolph Greasham, and Michel Chartrain 244-246

***R*-(−)-Mandelic Acid Production from Racemic Mandelic Acids Using *Pseudomonas polycolor* IFO 3918 and *Micrococcus freudenreichii* FERM-P 13221.** Eiji Takahashi, Katsuhiko Nakamichi, and Masakatsu Furui 247-250

Optimizing Control of Sensory Evaluation in the Sake Mashing Process by Decentralized Learning of Fuzzy Inferences Using a Genetic Algorithm. Kazuo Matsuura, Hiroyuki Shiba, Masato Hirotsune, and Masaaki Hamachi 251-258

Kinetic Study on Light-Limited Batch Cultivation of Photosynthetic Cells. James C. Ogbonna, Hirokazu Yada, and Hideo Tanaka 259-264

Microbial Degradation of Poly(3-Hydroxybutyrate) and Polycaprolactone by Filamentous Fungi. Yuji Oda, Hiroyuki Asari, Teizi Urakami, and Kenzo Tonomura 265-269

Cell Hydrophobicity Influencing the Activity/Stability of Xenobiotic-Degrading Microorganisms in a Continuous Biphasic Aqueous-Organic System. Miguel A. Ascon-Cabrera..... 270-275

Molecular Cloning and Sequence Analysis of the Gene Encoding an Endo α-1,4 Polygalactosaminidase of *Pseudomonas* sp. 881. Jun-ichi Tamura, Kaname Hasegawa, Kiyoshi Kadowaki, Yasuo Igarashi, and Tohru Kodama 305-310

Cloning, Expression, and Nucleotide Sequence of the *N*-Acyl-D-Aspartate Amidohydrolase Gene from *Alcaligenes xylosoxydans* subsp. *xylosoxydans* A-6. Mamoru Wakayama, Eiki Watanabe, Yasuhiro Takenaka, Yoshiro Miyamoto, Yuko Tau, Kenji Sakai, and Mitsuaki Moriguchi 311-317

A Locus of *Pseudomonas pickettii* DTP0602, *had*, That Encodes 2,4,6-Trichlorophenol-4-Dechlorinase with Hydroxylase Activity, and Hydroxylation of Various Chlorophenols by the Enzyme. Noboru Takizawa, Hideo Yokoyama, Kouji Yanagihara, Takashi Hatta, and Hohzoh Kiyohara 318-326

High-Level Expression of Human Fibroblast Growth Factor-9 N33 in *Escherichia coli.* Masato Kuriyama, Jyun-ichi Sakamoto, Masanori Nakatu, Tsutomu Kurokawa, and Hidekazu Sawada 327-333

Purification and Characterization of Two Xylanases and an Arabinofuranosidase from *Asperqillus sojae.* Isao Kimura, Hiroyuki Sasahara, and Shigeyuki Tajima 334-339

Hydrolysis of Palm Stearin Oil by a Thermostable Lipase in a Draft Tube-Type Reactor. Masanobu Tanigaki, Masaru Sakata, Hitoshi Takaya, and Koji Mimura 340-345

Production of Low Methoxyl Pectin Using Immobilized Pectinesterase Bioreac-

7 212HI XL 531 3/97 31249-200

tors. Anand Nighojkar, Sadhana Srivastava, and Anil Kumar 346–349
Effects of Amino Acid Addition on Molar Fraction of 3-Hydroxyvalerate in Copolyester of 3-Hydroxybutyrate and 3-Hydroxyvalerate Synthesized by *Alcaligenes* sp. SH-69. Joo Seok Yoon, Jeong Yoon Kim, and Young Ha Rhee 350–354
Effect of Yeast Fumarase Gene (*FUM1*) Disruption on Production of Malic, Fumaric and Succinic Acids in Sake Mash. Tetsuro Magarifuchi, Kuniyasu Goto, Yuzuru Iimura, Makoto Tadenuma, and Gakuzo Tamura..... 355–361
20-Hydroxyecdysone Production in *Ajuga* Hairy Root Controlling Intracellular Phosphate Content Based on Kinetic Model. Nobuyuki Uozumi, Satoshi Makino, and Takeshi Kobayashi..... 362–368
Light Supply Coefficient: A New Engineering Parameter for Photobioreactor Design. James C. Ogbonna, Hirokazu Yada, and Hideo Tanaka 369–376
Phosphate Uptake and Release Activity in Immobilized Polyphosphate-Accumulating Bacterium *Microlunatus phosphovorus* Strain NM-1. Kazunori Nakamura, Sinsuke Ishikawa, and Mamoru Kawaharasaki 377–382
Contribution of Extractives to Methanogenic Toxicity of Hemp Black Liquor. Sjon Kortekaas, Manuel Soto, Teresa Vicent, Jim A. Field, and Gatze Lettinga 383–388
Stability and Metabolic Versatility of a Propionate-Degrading Biofilm Operating in an Anaerobic Fluidised Bed Reactor. Gerhard Zellner and Frank Neudörfer 389–393
Production of HM-1 Killer Toxin in *Saccharomyces cerevisiae* Transformed with the *PDR4* Gene and δ-Sequence-Mediated Multi-Integration System. Tetsuya Kimura, Noriyuki Kitamoto, Yuzuru Iimura, and Yukio Kito 423–428
Proton and Carbon Inventory during the Growth of an Alkaliphilic *Bacillus* Indicates That Protons are Independent from Acid Anions. Sari Paavilainen, Mauri Mäkelä, and Timo Korpela 429–433
Regulation of Production of Leupeptin, Leupeptin-Inactivating Enzyme, and Trypsin-Like Protease in *Streptomyces exfoliatus* SMF13. In Seop Kim and Kye Joon Lee 434–439
Cloning and Expression of Trypsin-Like Enzyme from *Streptomyces fradiae* for Comparative Analysis of Functional Regions of *Streptomyces* and Mammalian Trypsins. Takaaki Katoh, Norihisa Kikuchi, Kiyoshi Nagata, and Nobuo Yoshida 440–445
Cloning and Expression of β-Glucosidase Gene from the Yeast *Pichia etchellsii*. Manjula Pandey and Saroj Mishra..... 446–453
Cloning and Sequencing of *chiC* Gene of *Bacillus circulans* WL-12 and Relationship of Its Product to Some Other Chitinases and Chitinase-Like Proteins. Md. Mustafa Alam, Naoki Nikaidou, Hirosato Tanaka, and Takeshi Watanabe..... 454–461
A Serine Proteinase of a Fungus Isolated from Dried Bonito "Katsuobushi". Masato Hiyama, Takashi Ohmoto, Masaaki Shinozuka, Kazuo Ito, Masaru Iizuka, and Noshi Minamiura 462–466
Increase in Urea-Resistance of Recombinant V8 Protease by Combining Mutations, and Its Application in the Releasing of a Peptide Hormone from a Fusion Protein. Masayuki Yabuta and Kazuhiro Ohsuye 467–472
Lipase-Catalyzed Enantiomeric Synthesis of Citronellyl Butyrate. Yongxiang Wang and Yu-Yen Linko 473–477
Enzymatic Hydrolysis of the Horn and Hoof of Cow and Buffalo. Kenji Kida, Shigeru Morimura, Junichiro Noda, Yoshitaka Nishida, Teruko Imai, and

Masaki Otagiri 478–484
Xanthan Biosynthesis in Continuous Culture: Citric Acid as an Energy Source. Asim K. Jana and Purnendu Ghosh 485–491
The Industrial Crystallization Method for Fructosylxyloside Produced by *Scopulariopsis brevicaulis*. Hiroyuki Takeda, Tetuhiro Hidano, and Shinichi Kinoshita 492–498
High-Rate Anaerobic Treatment of Wastewater under Psychrophilic Conditions. Salih Rebac, Julia Ruskova, Sybren Gerbens, Jules B. van Lier, Alfons J. M. Stams, and Gatze Lettinga 499–506
Effects of Carbon Source on the Application of a Novel Foreign Gene Expression System in *Saccharomyces cerevisiae* Using the Upstream Region of the *Candida tropicalis* Isocitrate Lyase Gene (*UPR-ICL*). Ken Umemura, Haruyuki Atomi, Tamotsu Kanai, Yutaka Teranishi, Mitsuyoshi Ueda, and Atsuo Tanaka 529–533
Sequencing of the β-Isopropylmalate Dehydrogenase Gene (*LEU2*) from *Acremonium chrysogenum* and Its Application to Heterologous Gene Expression. Hiroyuki Kimura, Shigeo Matumura, Masaru Suzuki, and Yasuhiro Sumino 534–540
Metabolic Pathway Analysis of Recombinant *Saccharomyces cerevisiae* with a Galactose-Inducible Promoter Based on a Signal Flow Modeling Approach. Sha Jin, Kaiming Ye, and Kazuyuki Shimizu 541–551
Hydrolysis Rates of Olive Oil by Lipase in a Monodispersed O/W Emulsion System Using Membrane Emulsification. Koichiro Shiomori, Toshimitsu Hayashi, Yoshinari Baba, Yoshinobu Kawano, and Tadashi Hano 552–558
Production of (*S*)-Citronellic Acid and (*R*)-Citronellol with an Interface Bioreactor. Shinobu Oda, Yūichi Inada, Akio Kato, Naotoshi Matsudomi, and Hiromichi Ohta 559–564
Screening of Yeasts for Production of Xylitol from D-Xylose. Sarote Sirisansaneeyakul, Michael Staniszewski, and Manfred Rizzi 565–570
Characteristics of Hydrogen Production by Aciduric *Enterobacter aerogenes* Strain HO-39. Haruhiko Yokoi, Takanobu Ohkawara, Jun Hirose, Satio Hayashi, and Yoshiyuki Takasaki 571–574
***In Vitro* Maintenance of Liver Function in Hierarchical Co-Culture of Hepatocytes and Non-Parenchymal Liver Cells.** Kiyohito Yagi, Nobuaki Sumiyoshi, Chikaomi Yamada, Nobuyasu Michibayashi, Yumiko Nakashima, Masaya Kawase, Yoshiharu Miura, and Tadashi Mizoguchi 575–579
Growth Characteristics of Liverwort Cells, *Marchantia paleacea* var. *diptera*, in a Photoautotrophic Suspension Culture. Masahito Taya, Masao Miya-oka, Yoshimasa Toyo-oka, Masahiro Kino-oka, Setsuji Tone, and Kanji Ono ... 580–585
Differences in the Intracellular Lipids of Sake Yeast in Main Mash Seeded Respectively with Two Kinds of Seed Mash: *Kimoto* and *Sokujo-moto*. Haruhiko Mizoguchi, Tomo Ikeda, and Shodo Hara 586–591
Characteristics of Hydrogen Sulfide Removal by *Thiobacillus thiooxidans* KS1 Isolated from a Carrier-Packed Biological Deodorization System. Kazuhiro Shinabe, Satoshi Oketani, Takashi Ochi, and Masatoshi Matsumura 592–598
Production and Optimization of Certain Growth Parameters for an Exopolysaccharide from *Azotobacter vinelandii* MTCC 2460 Isolated from a Plant Rhizosphere. Meenakshi V. Vermani, Shashikant M. Kelkar, and Madhusudan Y. Kamat 599–602

NOTES

Structural Relationships among Killer Toxins Secreted from the Killer Strains of the Genus *Williopsis*. Tetsuya Kimura, Noriyuki Kitamoto, Yasuhiro Ohta, Yukio Kito, and Yuzuru Iimura 85- 87

Extracellular Formation of Triglycerides from Glucose by a Mutant Strain of *Trichosporon*. Yasuhiro Nojima, Takashi Yagi, Tokichi Miyakawa, Hiroaki Matsuzaki, Takushi Hatano, and Sakuzo Fukui 88- 90

Purification and Characterization of Laccase from White Rot Fungus *Trametes sanguinea* M85-2. Yoshinori Nishizawa, Kazuki Nakabayashi, and Emiko Shinagawa 91- 93

Purification and Some Properties of NADH-Dependent Sulfite Reductase from *Escherichia coli* Harboring Plasmid pTHS1, Which Has the *S*-Adenosyl-L-Methionine: Uroporphyrinogen III Methyltransferase Gene of *Thiobacillus ferrooxidans*. Tsuyoshi Sugio, Sinji Matsugi, Tsuyoshi Tanaka, and Hiroyuki Suzuki 94- 96

Effect of Dilution Rate in Continuous Production of L-Ornithine by an Arginine Auxotrophic Mutant. Dae Keon Choi, Wuk Sang Ryu, Bong Hyun Chung, Soon Ook Hwang, and Young Hoon Park 97-100

Preparation of D-Psicose from D-Fructose by Immobilized D-Tagatose 3-Epimerase. Hiromichi Itoh, Tomoko Sato, and Ken Izumori 101-103

Production of the Edible Fungus Huitlacoche (*Ustilago maydis*): Effect of Maize Genotype on Chemical Composition. Pablo Emilio Vanegas, Maria Elena Valverde, Octavio Paredes-Lopez, and Jerald K. Pataky 104-106

Effective tPA Production by BHK Cells in Nutrients-Controlled Culture Using an On-Line HPLC Measuring System. Jin Wang, Hiroyuki Honda, Petros Lenas, Hideki Watanabe, and Takeshi Kobayashi 107-110

Effect of Fermentation Temperature on Relationship between Cell Viability and Trehalose Content of *Saccharomyces cerevisiae* KF-7 in Repeated-Batch Fermentation. Zhong Ya Ling, Shigeru Morimura, and Kenji Kida 204-207

Relationship between Ethanol Consumption Rate and Prochiral Ketone Reduction Rate in Bakers' Yeast. Tadashi Kometani, Yasufumi Morita, Yoshiharu Kiyama, Hidefumi Yoshii, and Ryuichi Matsuno 208-210

A Large Plasmid Isolated from *Rhizobium huakuii* bv. renge That Includes Genes for Both Nodulation of *Astragalus sinicus* cv. Japan and Nitrogen Fixation. Yong Xu and Yoshikatsu Murooka 276-279

Functional Role of *Aspergillus oryzae* Glucoamylase C-Terminal Domain Investigated Using Its cDNA. Tadashi Nagashima, Yutaka Yamamoto, Katsuhiko Kitamoto, and Chieko Kumagai 280-282

Comparative Studies of β-1,3-Glucanase A1 and B of *Bacillus circulans* WL-12: Purifications and Enzymatic Properties. Kazuhiko Aida, Takeshi Okada, Nobuo Kasahara, Naoki Nikaidou, Hirosato Tanaka, and Takeshi Watanabe 283-286

Growth Kinetics and Product Inhibition of *Lactococcus lactis* IO-1 Culture in Xylose Medium. Ayaaki Ishizaki and Tomoko Ueda 287-290

Properties of Sake Yeast Mutants Resistant to Isoamyl Monochloroacetate. Mutsumi Watanabe, Hideo Nagai, and Kyoichi Kondo 291-293

Antihypertensive Effect of the Milk Fermented by Culturing with Various Lactic Acid Bacteria and a Yeast. Yuji Kuwabara, Seiichiro Nagai, Noriko Yoshimitsu, Isao Nakagawa, Yasuo Watanabe, and Youichi Tamai 294-295

Isolation of a Lignin-Decolorizing Bacterium. Hiroshi Morii, Kunichika

Nakamiya, and Shinichi Kinoshita 296–299
BOD Sensor Using Magnetic Activated Sludge. Yasuzo Sakai, Norimasa Abe, Shingo Takeuchi, and Fujio Takahashi 300–303
Characterization of a Small Cryptic Plasmid, pLA105, from *Lactobacillus acidophilus* TK8912. Kazuo Kanatani, Takatsugu Tahara, Masao Oshimura, Keiji Sano, and Chisae Umezawa 394–399
Isolation and Identification of a Cyclopropanecarboxylate-Utilizing Bacterium. Hiroshi Nishihara, Yoshiyuki Ochi, Hisashi Nakano, Manabu Ando, and Tetsuo Toraya 400–402
Enhancement of Protein Synthesis in Continuous-Flow, Cell-Free System by Improvement of Membrane Permeation. Norihiro Nishimura, Yoshihisa Kitaoka, and Mitsuru Niwano 403–405
A Novel Pyrazine Compound Produced from Chitin by the Activity of the Enzyme from *Vibrio alginolyticus* TK-24. Takaaki Yanai, Atsushi Matsuda, Kazuhiko Okamura, Takashi Shin, and Sawao Murao 406–407
Gas Chromatography-Mass Spectrometric Analysis and Its Application to a Screening Procedure for Novel Bacterial Polyhydroxyalkanoic Acids Containing Long Chain Saturated and Unsaturated Monomers. Eun Yeol Lee and Cha Yong Choi 408–414
Using the Pressure of Biogas Created during Anaerobic Digestion as the Source of Mixing Power. Sang Rak Lee, Nam Kee Cho, and Won Jai Maeng 415–417
Isolation of Polyacrylamide-Degrading Bacteria. Kunichika Nakamiya and Shinichi Kinoshita 418–420
Effect of Carbon Dioxide Concentration on the Growth and RubisCO Activity of a Thermophilic Cyanobacterium, *Chroococcidiopsis* sp. Strain TS-821. Nobuhiro R. Hayashi, Tatsuya Ishida, Yuwadee Peerapornpisal, Yasuo Igarashi, and Tohru Kodama 507–509
Synthesis of Alkyl β-Mannosides from Mannobiose by *Aspergillus niger* β-Mannosidase. Hirotaka Itoh and Yoshi Kamiyama 510–512
Xylitol Formation and Key Enzyme Activities in *Candida boidinii* under Different Oxygen Transfer Rates. Eleonora Vandeska, Slobodanka Kuzmanova, and Thomas W. Jeffries 513–516
Effect of Temperature on Production of Lipopeptide Antibiotics, Iturin A and Surfactin by a Dual Producer, *Bacillus subtilis* RB14, in Solid-State Fermentation. Akihiro Ohno, Takashi Ano, and Makoto Shoda 517–519
Cloning and Sequencing of Two D-Xylose Reductase Genes (*xyrA* and *xyrB*) from *Candida tropicalis*. Shin-ichiro Yokoyama, Yoshiko Kinoshita, Tohru Suzuki, Keiichi Kawai, Hiroyuki Horitsu, and Kazuhiro Takamizawa 603–605
Oxidative Stress Response in Yeast: Induction of Glucose-6-Phosphate Dehydrogenase by Lipid Hydroperoxide in *Hansenula mrakii*. Linh-Thuoc Tran, Takeo Miki, Masaki Kamakura, Shingo Izawa, Yoshiyuki Tsujimoto, Shinji Miyabe, Yoshiharu Inoue, and Akira Kimura 606–609
Maleate *cis-trans* Isomerase from *Arthrobacter* sp. TPU 5446. Yasuo Kato, Jinsaku Yamagishi, and Yasuhisa Asano 610–612
Enzymatic Resolution of Racemic Ibuprofen Esters: Effects of Organic Cosolvents and Temperature. Won Hee Lee, Ki-Joo Kim, Min Gon Kim, and Sun Bok Lee 613–615
Effects of Incubation Conditions on the Release of a Recombinant Product in Immobilized *Escherichia coli* Cells. Osamu Ariga, Hisashi Toyofuku, Kazuyuki Matsudaira, Yoshiki Sano, and Iwao Kuroiwa 616–618
Effect of Hydrostatic Pressure on Hybridoma Cell Metabolism. Mutsumi

Takagi, Ken-ichi Ohara, and Toshiomi Yoshida 619–621

TECHNICAL NOTES

Estimating Segregational Plasmid Instability in Recombinant Cell Cultures: A Generalized Approach. Pinaki Bhattacharya and Debashis Roy 520–521

Improved Method for Pro-Urokinase Refolding with Inclusion Body from Recombinant *Escherichia coli*. Motoki Kubo and Akihiro Nishi 622–624

REVIEWS

Design of Microbial Processes and Manufactures Based on the Specialities and Traditions of a Region: A Kumamoto Case. Seinosuke Ueda and Yuji Teramoto 522–527

Copper/Quinone-Containing Amine Oxidases, an Exciting Class of Ubiquitous Enzymes. Ivo Frébort and Osao Adachi 625–632